What is claimed is:

1. A computer-implemented method of processing an image signal defining an image of a body fluid or tissue sample, the method comprising steps of:

eliminating from the image signal, those portions of the image signal not defining candidate blobs in which a rare cell may reside, forming a candidate blob image signal;

eliminating from the candidate blob image signal, those portions of the candidate blob image signal not defining the rare cell, forming a rare cell image signal; and

storing the rare cell image signal in a computer memory.

2. The method of claim 1, further for processing body fluid or tissue samples, the method further comprising:

contacting a body fluid or tissue sample at a location corresponding to each candidate blob represented in the subset of the first image data set, with a reagent to generate a biologically significant signal.

3. The method of claim 2, further comprising steps of:

receiving a body fluid or tissue sample image signal acquired after the step of contacting, the body fluid or tissue sample image signal corresponding to the rare cell image signal; and

measuring a biologically significant signal level within the body fluid or tissue sample image signal.

4. The method of claim 3, wherein forming the candidate blob signal further comprises:

receiving a color image signal representing the image of the body fluid or tissue sample; and

transforming the color image signal from a native color space representation to a processing color space representation in which candidate blobs may be readily identified by analyzing one coordinate signal thereof.

5. The method of claim 4, wherein the native color space is represented by coordinate signals whose values represent Red, Green and Blue (RGB) intensity, and the processing color space is represented by coordinate signals whose values represent Hue, Luminance and Saturation (HLS) magnitude.

6. The method of claim 4, further comprising:

creating a potential candidate blob image signal including image signal whose value of the one coordinate signal lies within a predetermined range.

7. The method of claim 6, further comprising:

creating as the potential candidate blob image signal, image signal corresponding to clusters of potential candidate blob signal points having a size lying within a predetermined range.

8. The method of claim 6, wherein forming the rare cell image signal further comprises:

receiving a color image signal representing the image of the candidate blob; and

transforming the color image signal from a native color space representation to a processing color space representation in which image characteristics to which predetermined selection criteria may be applied appear more prominently in one or more coordinate signals thereof.

9. The method of claim 8, further comprising:

creating a cell mask signal representing cell areas in the image by processing a first coordinate signal of the processing color space.

10. The method of claim 9, further comprising:

creating a selected cell signal representing areas containing selected cells in the image by processing a second coordinate signal of the processing color space.

11. The method of claim 10, further comprising:

creating a rare cell signal representing rare cell areas in the image by processing a third coordinate signal of the processing color space.

12. The method of claim 11, wherein the native color space is represented by coordinate signals whose values represent Red, Green and Blue (RGB), and the processing color space is represented by coordinate signals whose values represent Hue, Luminance and Saturation (HLS).

13. The method of claim 12, wherein the step of creating a cell mask signal further comprises:

analyzing a histogram of luminance values of the color image signal representing the candidate blob;

selecting for further processing, signal points having a luminance value above a last valley preceding a last peak of the histogram; and

applying to the selected signal points a closing filter, then excluding areas not fitting a predetermined size criterion, then applying a hole filling function, producing the cell mask signal.

14. The method of claim 12, wherein the step of creating a selected cell signal further comprises:

analyzing a histogram of saturation values of the cell mask signal;

selecting for further processing, signal points having a saturation value above a first valley following a first peak of the histogram;

applying to the selected signal points a closing filter, then applying a hole filling function, then excluding areas including a border of the image, then an erosion filter is applied, then a thick filter is applied, producing the selected cell signal.

15. The method of claim 12, wherein the step of creating a rare cell signal further comprises:

selecting for the rare cell signal, signal points coinciding with the selected cell signal, which includes a cluster of signal points lying within a predetermined size range, the cluster of signal points also having a hue value lying within a predetermined hue value range.

16. The method of claim 11, further comprising:

processing substantially only rare cell areas to generate a biologically significant signal.

17. The method of claim 16, further comprising:

acquiring an image of the body fluid or tissue smear;

detecting in the acquired image the biologically significant signal; and

recording presence of the biologically significant signal when coincident with a rare cell area from the rare cell data set.

18. The method of claim 16, further comprising:

acquiring an image of a rare cell area of a body fluid or tissue smear, the rare cell area defined by the rare cell data set; and

recording presence of the biologically significant signal in the rare cell area.

19. A computer software product including a computer-readable storage medium having fixed therein a sequence of instructions which when executed by a computer direct performance of steps of:

eliminating from the image signal, those portions of the image signal not defining candidate blobs in which a rare cell may reside, forming a candidate blob image signal;

eliminating from the candidate blob image signal, those portions of the candidate blob image signal not defining the rare cell, forming a rare cell image signal; and

storing the rare cell image signal in a computer memory.

20. The product of claim 19, further for processing body fluid or tissue samples, the the sequence of instructions further including the steps of:

removing from further processing a body fluid or tissue sample for which no subset of the first data set representing a candidate blob is created; and

contacting a body fluid or tissue sample at a location corresponding to each candidate blob represented in the subset of the first image data set, with a reagent to generate a biologically significant signal.

21. The product of claim 20, the sequence of instructions further including the steps of steps of:

receiving a body fluid or tissue sample image signal acquired after the step of contacting, the body fluid or tissue sample image signal corresponding to the rare cell image signal; and

measuring a biologically significant signal level within the body fluid or tissue sample image signal.

22. The product of claim 19, wherein forming the candidate blob signal further comprises:

receiving a color image signal representing the image of the body fluid or tissue sample; and

transforming the color image signal from a native color space representation to a processing color space representation in which candidate blobs may be readily identified by analyzing one coordinate signal thereof.

23. The product of claim 22, wherein the native color space is represented by coordinate signals whose values represent Red, Green and Blue (RGB) intensity, and the processing color space is represented by coordinate signals whose values represent Hue, Luminance and Saturation (HLS) magnitude.

24. The product of claim 22, the sequence of instructions further including the step of:

creating a potential candidate blob image signal including image signal whose value of the one coordinate signal lies within a predetermined range.

25. The product of claim 24, the sequence of instructions further including the step of:

creating as the potential candidate blob image signal, image signal corresponding to clusters of potential candidate blob signal points having a size lying within a predetermined range.

26. The product of claim 19, wherein forming the rare cell image signal further comprises:

receiving a color image signal representing the image of the candidate blob; and

transforming the color image signal from a native color space representation to a processing color space representation in which image characteristics to which predetermined selection criteria may be applied appear more prominently in one or more coordinate signals thereof.

27. The product of claim 26, the sequence of instructions further including the step of:

creating a cell mask signal representing cell areas in the image by processing a first coordinate signal of the processing color space.

28. The product of claim 27, the sequence of instructions further including the step of:

creating a selected cell signal representing areas containing selected cells in the image by processing a second coordinate signal of the processing color space.

29. The product of claim 28, the sequence of instructions further including the step of:

creating a rare cell signal representing rare cell areas in the image by processing a third coordinate signal of the processing color space.

30. The product of claim 29, wherein the native color space is represented by coordinate signals whose values represent Red, Green and Blue (RGB), and the processing color space is represented by coordinate signals whose values represent Hue, Luminance and Saturation (HLS).

31. The product of claim 30, wherein the step of creating a cell mask signal further comprises:

analyzing a histogram of luminance values of the color image signal representing the candidate blob;

selecting for further processing, signal points having a luminance value above a last valley preceding a last peak of the histogram; and

applying to the selected signal points a closing filter, then excluding areas not fitting a predetermined size criterion, then applying a hole filling function, producing the cell mask signal.

32. The product of claim 30, wherein the step of creating a selected cell signal further comprises:

analyzing a histogram of saturation values of the cell mask signal;

selecting for further processing, signal points having a saturation value above a first valley following a first peak of the histogram;

applying to the selected signal points a closing filter, then applying a hole filling function, then excluding areas including a border of the image, then an erosion filter is applied, then a thick filter is applied, producing the selected cell signal.

33. The product of claim 30, wherein the step of creating a rare cell signal further comprises:

selecting for the rare cell signal, signal points coinciding with the selected cell signal, which includes a cluster of signal points lying within a predetermined size range, the cluster of signal points also having a hue value lying within a predetermined hue value range.

34. The product of claim 29, the sequence of instructions further including the step of:

processing substantially only rare cell areas to generate a biologically significant signal.

35. The product of claim 34, the sequence of instructions further including the steps of:

acquiring an image of the body fluid or tissue smear;

detecting in the acquired image the biologically significant signal; and

recording presence of the biologically significant signal when coincident with a rare cell area from the rare cell data set.

36. The product of claim 34, the sequence of instructions further including the steps of:

acquiring an image of a rare cell area of a body fluid or tissue smear, the rare cell area defined by the rare cell data set; and

recording presence of the biologically significant signal in the rare cell area.

37. The method of claim 1 wherein the body fluid is maternal blood and the rare cell is a fetal cell.